

Appln No. 10/603,082
Zaiqian HU
Office Action dated April 21, 2004

REMARKS/ARGUMENTS

The Examiner is thanked for the Official Action dated April 21, 2004. This amendment is intended to be fully responsive thereto.

The Claim Amendments

Claims 1 and 8 have been cancelled.

Claim 2 has been amended to provide for the limitations of hydraulic diameter to less than about 0.6mm and fin height of less than or equal to about 10.0mm. Claim 3 has been amended relative to the hydraulic diameter of the first or second tube and depends on currently amended claim 2.

Allowable Subject Matter- Claim 4-9

Claim 4 has been amended to be put into independent form including all the limitations of previous claims 1 and 4, and, as such, Applicant asserts, responds to Examiner's suggestion, overcomes Examiner's objection, and this claim is now in condition for allowance.

The Examiner objected to claims 8 and 9 as being dependent on a rejected base claims but allowable if rewritten in independent form. Newly amended claims 5-9 now are ultimately dependent on new claim 5, which has all the limitations of previous claim 8. Therefore, Applicant respectfully contends that these claims are also allowable.

The limitations of previous claim 8 (which was deemed allowable if rewritten in independent form), have been incorporated in previous claim 5, thus overcoming Examiner's objection and making the matter of currently amended claim 5 (currently equivalent to previous claim 8) allowable.

Claims 6 and 7 depend upon currently amended claim 5, and, therefore, are in condition for allowance. Currently amended claim 9 now depends on currently amended claim 5 (comprising the limitations of previous claim 8) and is, therefore, also in condition for allowance.

Continuing Claim Amendments

Claim 10 has been amended to include the limitation that the first tube and second tube define a plurality of sub-passageways extending along a length of the first tube and second tube, wherein each of the sub-passageways of the first tube and second tube have a cross-sectional area perpendicular to the length of the first tube and second tube that is between about 0.02 mm² and about 1.00 mm².

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Applicant asserts that the present limitation overcomes any potential 35 USC § 102 or § 103 issues, and that currently amended claim 10 is both new and unobvious over any of the prior art cited.

Claim 11 and 12 have been similarly amended, and are now also both new and unobvious over any prior art cited.

Claim 13 depends on newly amended claim 12 and, newly amended claim 14, on newly amended claim 4, and Applicant asserts that both are now in condition for allowance.

New Claims

New claims 15-17 have been added.

The 35 USC 102 Rejections

The Examiner rejected previous claims 1-3, 10 and 11, as anticipated by Yamamoto et al ('944).

Claim 1 has been cancelled rendering that rejection moot.

Claim 2 and dependent claim 3, have been amended so that they comprise the limitations of first or second tube hydraulic diameter of less than about 0.6mm and fin height less than 10.0mm. Applicant contends, therefore, that newly amended claim 2 and dependent claim 3, are new versus the prior art and overcome Examiner's 35 USC 102 rejection.

Examiner also rejected previous claims 11 and 12 as anticipated by Yamamoto ('944). Claims 11 and 12 have been amended to include the limitation of first and second tubes having sub-passageways with cross sectional areas as in allowable claim 4. Applicant asserts that newly amended claims 11 and 12, with these limitations, are both new and non-obvious, and are now in condition for allowance.

The 35 USC 103 Rejections

The Examiner rejected claim 14 as being unpatentable over Yamamoto ('944) in view of Yamamoto ('935). Newly amended claim 14 now depends on claim 4, which has been deemed allowable subject matter by Examiner. Therefore, Applicant contends that claim 14, in its currently amended form, overcomes this rejection and is in condition for allowance.

The Examiner also rejected claims 5-7 as being unpatentable over '944 in view of '935. In doing so, Examiner contends that it would be obvious to combine the teaching of '944 and '935, stating that the combination of the general heat exchanger of '944, with no disclosure of 'fin height less or equal to 8.00mm' will be obvious as '935 teaches fins having a height is less than or equal to 8.00mm.'

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Newly amended claim 5 now includes the limitation of previous claim 8, previous claim 8 being deemed allowable by Examiner if rewritten in independent form. Applicant affirms that presently amended claim 5, and its dependent claims 6 and 7, are now allowable.

Examiner further rejected claim 12 and 13 as unpatentable over Ohashi (J -04 369396), in view Yamamoto ('944). Newly amended claims 12 and 13 have the limitation of sub-passageways and specific cross-sectional area limitations as described above.

Neither Ohashi or Yamamoto teach or suggest, alone or in combination, the specific sub-passageways limitations and hydraulic diameter limitations required by currently amended 12 and 13. Since neither reference would lead one of ordinary skill in the art to combine these references, particularly with the stated limitations in the claims, Applicant respectfully asserts that these claims are now in condition for allowance.

Remarks- Newly Amended Claims 2 and 3

Previous claim 2 has been amended to be in independent form and comprises the limitations of both a hydraulic diameter of first or second tube less than about 0.6mm and fins of height less than or equal to about 10.0mm. Currently amended claim 2 is, therefore, new over any of the prior art cited. In addition, the limitation of less than about 0.6mm and fins height less than or equal to about 10.0mm is not taught or suggested by the art cited, and, particularly, not by art cited over Yamamoto '944.

The limitations of the invention of '944 appear clear based on the general description of '944. Column 2, lines 30-35 state that "to achieve the above noted object,...the equivalent diameter d_e (in units of mm) is in the range of greater than or equal to 0.60 to less than or equal to 1.15 (mm) . In reading this limitation, '944 clearly teaches away from small tube equivalent diameters and would lead one of ordinary skill of the art away from tubes of small dimensional sizes such as the below 0.60mm of the presently amended claims. Nothing in '944 teaches or suggests to combine it with any reference related to fin height, and, '944 would, in fact, lead away from the invention of newly amended claim 2 and dependent claim 3.

New claims

New claims 15-17 describe a heat exchanger with first tube with hydraulic diameter less than 1.00mm with a plurality of sub-passageways extending a length of the tube, and a second tube with hydraulic diameter less than 1.00mm with a plurality of sub-passageways extending a length of the tube, wherein the sub-passageways have cross sectional area perpendicular to the length of the tubes between about 0.02mm² and 1.00mm².

As discussed above, Applicant contends that new claims 15-17, with their present limitations, are both new and non-obvious based on the prior art cited.

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Summary

Based on the foregoing, it is respectfully submitted that claims 2-7 and 9-17, in their current forms, define the invention over the prior art of record and are in condition for allowance, and notice to that effect is earnestly solicited. Should the Examiner believe further discussion regarding the above claim language would expedite prosecution, please be invited to contact the undersigned at the number listed below.

Respectfully submitted:

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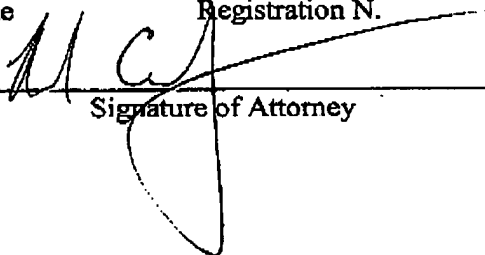
I hereby certify that this correspondence is being transmitted by
facsimile to The Assistant Commissioner of Patents,
Alexandria VA, 22313-1450 on August 20, 2004

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